AN ESSAY ON THE Value of the MINES, LATE OF Sir *Carbery Price.*

By *WILLIAM WALLER*, Gent. Steward of the said MINES.

Writ for the private Satisfaction of all the PARTNERS.

The Second Edition.

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THE

Epiſtle Dedicatory

TO

Sir HUMPHRY MACKWORTH,

CHAIR-MAN,

And now ſtanding in the Place of EDWARD PRICE, Eſq; and late of Sir CARBERY PRICE;

AND TO

The moſt Noble, his Grace, the Duke of LEEDS,

The Right Honourable the Marqueſs of CARMARTHEN,

The Right Honourable *Pawlet*, Earl of BULLINGBROOK,

The Right Honourable *James*, Lord Viſcount LANESBOROUGH,

The Epiſtle Dedicatory.

The Right Honourable *William*, Lord *Digby*,

The Honourable Sir *Humphry Edwin*, Knight, Lord Mayor of LONDON,

The Honourable *Hatton Compton*, Eſq;

AND TO

The Honoured, the Lady *Ann Cholmley*, Mrs. *Mary Cholmley*, Mrs. *Bridget Peſhall*, Mrs. *Jane Bickerſtaffe*, Mrs. *Ann Hill*, Mrs. *Elizabeth Lloyd*, Widow, Mrs. *Eliz. Lloyd*, Spinſter, Mrs. *Lucy Wright*;

AND TO

The Honoured Sir *Thomas Matkworth*, Baronet, Sir *John Price* Baronet, Sir *John Morden*, Knt. Sir *Charles Bickerſtaffe*, Knt. Sir *Chriſtopher Wren*, Knt. Sir *Paul Whitchcot*, Knt.

AND TO

The Honoured *Edward Price*, Eſq; *Henry Farmer*, *William Powell*, *Edward Nicholas*,

cholas, Bulkley Mackworth, Philip Bickerſtaffe, Arthur Moor, Henry Lloyd, John Meyrick, John Pugh, James Blake, William Freeman, Samuel Trotman, William Nicholas, Joſeph Short, Rich. Stephens, Geo. London, Hen. Simons, Hen. Grove, and *Joh. Wodehouſe,* Eſquires;

AND TO

Mr. *John Oldbury, Thomas Phips,* Senior, *Paul Docminique, Whitfield Hayter, Anthony Forty, William Woolley, Thomas Phips,* Junior, *Richard Chancy, Richard Curtis, Thomas Fredericke, Gabriel Glover, John Glover, Thomas Jeve, John Thrale, Nathaniel Troughton, John Newland, John Preſton, Edward Grace, John Hayword, James Hallet,* Merchants, preſent PARTNERS of the ſaid MINES.

HAving had the Honour to be employed in the Management of theſe Mines, of Sir Carbery Price, *for ſix Years laſt paſt, and being much concerned to ſee ſo great a Treaſure lye dead*

and

and unwrought, meerly for want of a Stock, and a right Conſtitution for the Management thereof; and finding ſome of the Partners unhappily engaged in Differences and Law-ſuits amongſt themſelves, and no probability of any Reconciliation, or the Works going forward, without the Aſſiſtance of ſome Publick-ſpirited Gentleman, who both underſtood the Art of Mining, and alſo compoſing of Differences; I thought it my Duty and Intereſt to make an Enquiry, if poſſibly I could find out ſuch a Perſon, who would purchaſe the Shares late of Sir Carbery Price, *and heartily engage for the Publick Good.*

But when all the Qualifications are conſidered that were neceſſary to be found in one Perſon, *upon this Occaſion, I preſume your Honours will*

be

be much enclined to believe that I undertook no very eaſie Task.

For, when I met with an honeſt Gentleman, I generally found that he was very unskilful in Matters of this nature, and either unable, or fearful, to engage in ſo great an Undertaking; and when I met with a Gentleman who had any Knowledge of theſe things, I preſently perceived that he was for graſping at all, and, inſtead of being willing to grant any thing for the publick Good, was ſtill for getting more for his own particular and private Advantage.

So that upon the whole Matter, I found that ſome had Money, but no Skill; others had Skill, but no Money; ſome again had both Skill and Money, (which was very rare) but yet wanted that generous and pub-

publick Spirit that was neceſſary in this Caſe; and where-ever I found a Perſon who was well diſpoſed in the general, and well qualified in other reſpects, yet he either wanted Courage to venture ſo great a Sum of Money, or Judgment to underſtand the preſent Conſtitutions of the Company, and how to amend them for the publick Good.

But at laſt, when I was, in a manner, in Deſpair, and had given over all Hopes of Succeſs, it was my Fortune to Travel to Neath, *in* Glamorgan-ſhire, *where I had the Favour of being admitted to ſee the Copper-works and Coal-works of Sir* Humphry Mackworth; *and having obſerved his new Contrivances in the Management thereof, which were more than I had ſeen before in any part of this Kingdom;*

and

and taking notice of his Judgment in Matters of Law, and alſo of his frank and generous Diſpoſition for the publick Good; and that he was by no means of a covetous or graſping Temper, but took delight in the Advantage he brought to others, eſpecially the poor Miners and Labourers, as well as in the Gains he got for himſelf.

I preſently concluded, that he was the fitteſt Perſon I knew, to ſet the Wheels a going with us in Cardiganſhire; *and, I humbly conceive, your Honours would all be of the ſame Opinion, if it were lawful for me to diſcover the ſeveral Improvements I obſerved at his Works, many of which being yet kept as ſecrets, I muſt forbear to mention.*

But his new Method of Coffering out the Water from his Shafts and

Sinking-pits, and thereby preventing the Charges of Water-engines, and alſo recovering a large Vein of Coal by that means, which was in vain attempted by other Artiſts; and his new Sailing-Waggons, for the cheap Carriage of his Coal to the Water-ſide, whereby one Horſe does the Work of ten at all times; *but when any Wind is ſtirring (which is ſeldom wanting near the Sea)* one Man and a ſmall Sail does the Work of twenty, *(which are publick,) do ſufficiently ſhew what his Genius is capable of in Matters of that nature.*

And, I believe, he is the firſt Gentleman, in this part of the World, that hath ſet up Sailing-engines on Land, driven by the Wind, *not for any Curioſity, or vain Applauſe, but for real Profit, where-by*

by he could not fail of Biſhop Wilkins's *Bleſſing on his Undertakings, in caſe he were in a Capacity to beſtow it.*

But I muſt beg leave, not only to mention theſe things, (which (however others may juſtly Value) I know he is pleaſed to eſteem but as accidental Trifles that fell in his way) but alſo to take notice of his prudent Methods, for reducing all his Undertakings to a Certainty, free from Hazard; his Coppermen working by the Tun, and his Colliers by the Weigh, at a certain Price, which is conſtantly and punctually Paid; whereby, as no Fraud can happen to himſelf, without a Combination of all, ſo good Encouragement is given to the Workmen, to be Careful and Induſtrious, for their own Intereſt as well as their Ma-

ſters, not to mention the convenient Scituation of his Copper-work, which is ſuch, that his Men may run the Coal, with Wheel-barrows, into the very Furnaces, and bring the Oar by Water within a Stone's caſt of the Work; nor his Prudence, in ſecuring Partners who had quantities of good Copper Oar to be ſmelted with his own Coal, before he began his Copper-work, whereby the Neceſſity of raiſing a great Stock, keeping many Agents and Stewards, at great Salaries, in ſeveral Counties, and great Hazards of bad Bargains, and bad Oar, with many other Inconveniencies incident to other Undertakings of that kind, were all prevented, and not only a great Profit made of the Copper, but alſo a great Vent ſecur'd for his own Coal, both at home in his own Copper-work,

and

and alſo abroad in the Weſt of England, *in exchanging Coal for Copper Oar.*

In all which, and in many other Reſpects, which will hereafter appear, ſuch Management and Conduct may very well be admired, eſpecially in a Gentleman that was bred up another way.

But I dare not expreſs the Honour and eſteem I have for this Gentleman, for fear of giving Offence, and therefore I have only hinted at theſe things at preſent, for my own Vindication, that your Lordſhips and all the Partners may know the true Motives that induced me to labour for this Revolution, and to bring in Sir Humphry Mackworth *to be ſo highly concerned in theſe Works*, for the common Good of all the Partners, *as well as my own, and*

and all the Agents employed under them.

It was for this end I firſt communicated theſe Thoughts to Mr. Price, *and* Mr. Powel, *in the Country, who knowing theſe things to be true, and being extreamly pleaſed with my Propoſal, ordered me to proceed therein, which accordingly I did, and having now ſpent near a Year's Time about it, and at laſt happily effected my Deſign, to the Satisfaction of all Parties.*

I humbly hope your Honours are, or in a ſhort time will be of Opinion, when your Term is lengthened, and your Conſtitutions ſettled to your own Content, that I have not miſſpent my Time in your Service.

I muſt confeſs that nothing ever troubled me ſo much, as the Misfortunes I laboured under on the account of

of theſe Mines: That I ſhould leave my own Habitation, and ſo many Works in the North, *(in all which I had been fortunate even beyond expectation) and come ſo far into a ſtrange Country to loſe my Labour, and when I had got Mines under my Management of ſo great a Value, my Hands ſhould be tied up, by unhappy Differences, from either making Profit to you or my ſelf; and, at laſt, that it ſhould be* Recorded in Hiſtory *to all Poſterity*, That the richeſt Mines, of that kind, in theſe three Kingdoms, and perhaps in all the Chriſtian World, lay dead and unprofitable, for ſo many Years, during my Stewardſhip; *whereas if theſe Mines had been carried on with a large Stock, and to the beſt Advantage, they might by this time*

time have raiſed the Fortunes of all the Partners concerned, and been as famous in foreign Countries, as moſt other Mines in the World.

When I firſt viewed theſe Mines, and undertook this Employment, I freely offered (for the Encouragement of all the Partners) to take my Salary out of the clear Profits, but I always apprehended, that I was not to Suffer for any other Perſon's Default but my own; and, on that account, I am ſo far from repenting of my Bargain, that allowing one Year to put the Works in order, and aſſuring me of good Management for the future, I ſhall be ready (inſtead of 250 l. per Ann. *preſent Salary) to take* 100 l. *for every* 10000 l. *a Year clear Profits, which ſhall accrue from theſe Mines to your Treaſury, over and above*

all

all and all manner of Charges and Expences whatſoever.

My Lords,

I have at my leiſure Hours, and for want of an Opportunity of doing your Lordſhips and your Partners better Service, conſidered the Profits, that are uſually made of other Veins, both at home and abroad, eſpecially in the North of England, *where I am beſt acquainted, and have compared the Charges and Profits thereof, and of theſe Mines together, and the vaſt Advantages theſe Mines have above any of them, which I did at firſt for my own private Uſe.*

But being now adviſed, that it would be a great Satisfaction to your Lordſhips, and all the Part-

ners, to have a more large Account given of theſe Mines, and that your Lordſhips are deſirous to know my Reaſons for ſetting the ſame at ſuch a Valuation, upon which your Lordſhips, and all the Partners, may be capable of being the beſt Judges of the Value thereof your ſelves, I have therefore humbly preſumed (tho' a Perſon otherwiſe very unworthy to appear in Print) to publiſh this following Eſſay on the Value of theſe Mines, for your Lordſhips particular and private Satisfaction.

And leſt it may be thought I have writ this for any particular Advantage to my ſelf, or to encourage others to any Undertaking, in which I durſt not venture my own Bottom, as well as theirs; I humbly beg leave hereby to offer to your

Lord-

Lordſhips, and all the Partners, that I ſhall be ready at all times to accept of Shares for my Salary at the higheſt Rate that was ever yet given for them.

Provided always that you agree together to ſettle a good Conſtitution for the Management thereof, and to raiſe a competent Stock proportionable to ſo great an Undertaking, to which I am alſo willing to lay down my Proportion, and ſtand or fall by my former and preſent Valuation.

For tho' I am ſenſible the ſame may ſeem very high, and almoſt incredible to others, who do not know the Advantages of theſe Mines, or believe that they are ſo large as they are deſcribed; yet, to my ſelf, who have ſpent ſo much Time, and ta-

ken ſo much Pains to conſider of it, and take the exact Meaſures of them, I have great Reaſon to believe (taking one thing with another) that I have rather ſet them below, than above, the real value.

For, Firſt, *The Price of the raiſing the Oar, in the great Vein, is ſet at Fourteen Shillings and Threepence* per *Tun, in the laſt Valuation, which is much higher than it will really coſt when the Levels are carried home.*

Secondly, *The Five leſſer Veins of Lead are ſet very much below the real Value, if managed with a large Stock.*

Thirdly, *The Copper Veins would employ a much greater number of Men, with brisk Management: And,*

Fourth-

Fourthly, *The Profits of the Silver (which may probably amount to the Value of all the reſt) is not computed at all, but only mentioned in general Terms.*

And, as to the largeneſs of the Veins, there are ſeveral Gentlemen, now in Town, who have been in that Country (viz.) *Dr.* Thompſon, *Miniſter of* Friday-*Church*, *Mr.* Phips, *of* Clerkenwel-green, *Mr.* Hoile, *in the* Still-yard, *Mr.* Duckett, *in the* Strand, *near* Exeter-Change, *and ſeveral others.*

Who, I ſuppoſe, will all own I ever repreſented, thoſe Veins they took the trouble to view, (which were only the great Vein, and the Bog Vein) rather leſs than greater than

than they really were; but, at that time, I had not diſcovered the two Copper Veins, nor the Richneſs of the five leſſer Lead Veins, which now make your Honours Intereſt of double the Value it was in the Year 1693.

And therefore ſince your Honours are now like to have the Advantage of my Labours, and new Diſcoveries; and, ſince I have been the Inſtrument (under Providence) of bringing in a Gentleman to redreſs your Grievances and encreaſe your Term, I can never doubt, having Right done me at your Hands, nor the Works being carried on to the beſt Advantage.

And, for my part, your Honours ſhall all find, that I ſtand upon an honeſt

neſt Bottom, and That the common Good of all Parties concerned, is all that is deſired, by

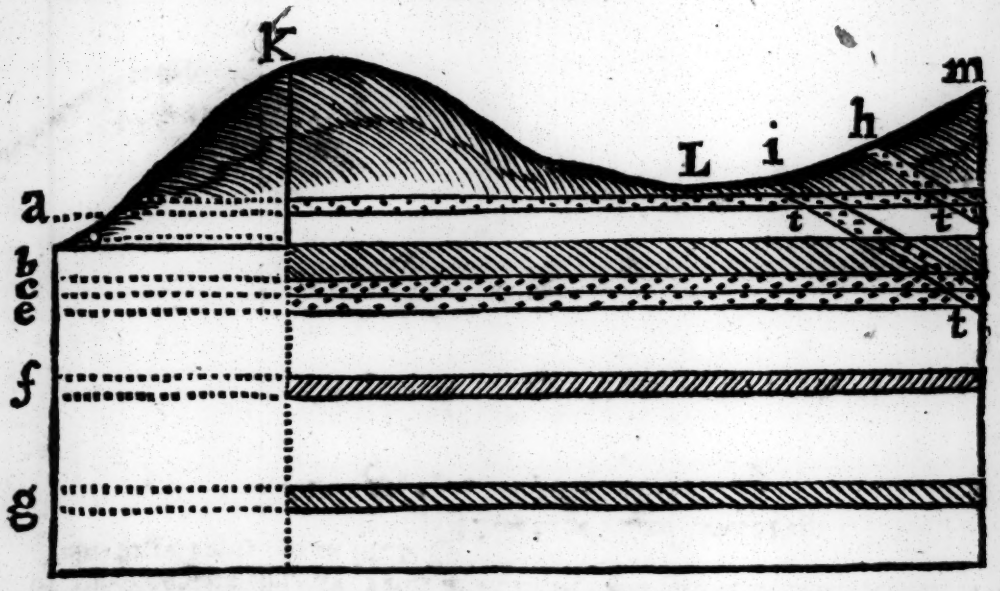
Your HONOURS

Moſt Obedient and moſt

Humble Servant,

WILLIAM WALLER.

A DESCRIPTION *of the Silver, Lead, and Copper-mines, late of Sir* Carbery Price, *lying in* Cardiganshire, *within four Miles of the Navigable River* Dovey, *and from thence a Mile by Water to the Port of* Aberdovey, *where Veſſels of three or four hundred Tuns may ride with great Safety.*



a THE North Vein of Lead-oar, three Foot wide.

b The great Lead Vein, Eleven Foot wide.

c A Vein of Lead-oar ſix Foot wide.

g A Vein of Lead-oar three Foot wide.

f A Vein of Green Copper-oar, four Foot wide, and yields three Tun of Copper from twenty Tun of Oar.

g The Bog Vein, Four Foot wide, all Potter's Oar.

h The Croſs Vein of Lead-oar, three Foot wide.

i The Croſs Vein of Brown Copper-oar, five Foot wide, and yields five Tun of Copper out of twenty Tun of Oar.

k The firſt great Shaft and Weſtern Boundary.

l The Eaſt Level.

m The Eaſtern Boundary.

t t t The places where the Croſs Veins meet with the other Veins; which are called by Miners, the (*T*) of the Veins, and are accounted the richeſt part of them.

o The Weſt Level.

Note, *All the ſaid Veins are fix'd and ſettled betwixt firm and ſolid Sides, and riſe equally near to the Surface of the Ground; and all (except the Croſs Veins) lye parallel to the great Vein, deſcending downwards like the Mine of* Potozi; *but being many in Number, and croſſing each other, could not be better deſcribed together on Paper.*

The Scale for the Length four hundred Yards in an Inch; and for the Height of the Mountain eighty Yards in an Inch; and for the Diſtance between the Veins forty Yards in an Inch.

[This to be Placed before Page 1.]

AN

ESSAY

ON THE

Value of the Mines,

LATE OF

Sir CARBERY PRICE.

WHAT great Advantages have been made from Mines and Minerals in all Ages, is a thing so well known, that it will be altogether unneceſſary to enlarge upon it, being generally admitted in all countries abroad, and even at home in this our own Nation, where many great Families have been raiſed, or much enriched by them, beſides Artificers and Tradeſmen; and where a vaſt number of poor People live thereby,

the very Women and Children finding Employ therein, as well as the Men, especially in the Mines of Lead.

The ingenious Mr. *Carew*, in his Essay on the State of *England*, in relation to its Trade, its Poor, and its Taxes, hath this Expression, Viz. *Nor is this all the Product of our Earth, whose Womb being big with Treasure, longs to be delivered, and after many Throws, brings forth Lead, Tin, Copper, Calamy, Coal, Culm, Iron, Allom, Copperas and sundry other Minerals; which return us great Treasure from Foreign Markets, whither they are exported.*

And Sir *Josiah Child*, in his Judicious Discourse of Trade, tells us, 'That our 'Lead and Tin, which are Natives, and 'by God's Blessing, inseparably annex'd 'to this Kingdom, carry on much of our 'Trade to *Turkey*, *Italy*, *Spain* and *Portugal*; besides great Quantities that are 'sold to *Holland*, to *France*, and to the '*Indies*, as is well known to all Merchants that trade to those Parts.

But yet many Gentlemen have been much discouraged of late from laying out their Money upon Mines, by reason of several Disappointments that they have met withal; some of which were occasioned

ed by the Ignorance of common Workmen, miſtaking the Sprigs of a Vein for the main Body, which yet an experienced Artiſt can eaſily diſtinguiſh at firſt ſight. Sme by the Knavery of Miners who have lodged a Quantity of Oar in a Shaft or Drift ſo artificially, as might deceive an ordinary Spectator. Others again have been defeated in their Expectations, when they have had a good Vein, either by paying too high a Duty to the Lord of the Soil, clear off all Charges, or elſe for want of a ſufficient Stock to carry on their Works; for when the Proprietor is not able to make a juſt and punctual Compliance in his Bargains and Payments, and raiſe a Stock of Oar beforehand, that Work muſt needs ſtop before it's brought to Perfection, and ſo like an Houſe unfiniſhed, and without a Cover, muſt neceſſarily fall together into Ruine and Confuſion; or at leaſt the Proprietor muſt comply to ſuch unprofitable and diſadvantagious Bargains, and ſubmit to ſo great Expences for want of convenient Levels to carry off and drain the Water from the Works, as will render his Deſigns fruitleſs, and the richeſt Treaſure of that kind unprofitable.

And therefore whoever will begin
Work of this nature, must first conside
the necessary Charges of making the Le
vels, Adits, Shafts, Smelting-houses, &c
and whether he hath a Stock sufficien
for all these things, and thereby to la
a right and sure Foundation for so grea
an Undertaking: For if he hath not, al
his Money expended will be lost, and i
a manner thrown away; but on the o
ther hand, where such large Veins o
Lead and Copper-oar are actually foun
fixt and settled betwixt their firm an
solid Sides, (as these are) the Lord's Du
ty bought off, and a competent Stoc
first raised to carry on the same wit
Effect, and to the best Advantage, the
the Profit is vastly great, and as certai
as any Estate in the World: No Ma
living ever finding the Bottom of suc
Veins, or failing of great Profit, till th
Works are wrought so very low benea
the Levels (which in this Case must
in the next Age) that the Water grow
too hard for them.

There are in the North of *Englan*
many rich Mines discovered; but the
is none either in *England* or *Wales*, th
can pretend to come near the Value

the famous Mines of Sir *Carbery Price*: I have not read or heard of ſuch a Mine of Lead in all the World, as the great Vein, which is eleven Foot wide betwixt its firm Sides, and ſeven Foot and a half already in pure Oar, which ſtill increaſes downwards, and 'tis not doubted but at laſt it will come to be eleven Foot wide in Oar. And I humbly conceive, I may confidently affirm, That no Hiſtory hath yet given us an Inſtance of ſo many rich Mines, both of Lead and Copper, lying ſo near together: And really I cannot but think it is a great Pity and Loſs, not only to the Owner, and to that County, but even to the whole Nation, that ſo great a Treaſure ſhould lye dead and unwrought, meerly for want of a right Underſtanding thereof.

And therefore I have undertaken, with all Submiſſion to better Judgment, to give my Opinion of the Value of the ſame: In doing of which, if I ſeem to any Perſon to exceed beyond the Bounds of a moderate Valuation, yet ſince I have wrote nothing but what I firmly believe, and durſt venture my own ſmall Fortune in the World upon it; I humbly hope the candid Reader will not be offended with

me

me for only offering ſuch Reaſons to his Conſideration, as by long Practice and Experience in the Mining-trade, hath induced me to be of that Opinion; in which I deſire to be underſtood aright: And therefore my Valuation doth always pre-ſuppoſe that the Mines are purchaſed free from any Duty to the Lord of the Soil, and that a Stock of 20000 *l.* be raiſed, whereof ſome part to be employed for making the Levels, Adits, Shafts, Smelting-houſes, *&c.* and raiſing ſeveral Stages or Stelches, for a Number of Men to be employed together (at which time the Work will be clear of all Obſtructions from Water, and two Men by blaſting upwards with Gun-powder, will get more Oar, than ſix can do now with their Working-Tools) and that the Reſidue thereof be employed in raiſing a Stock of Oar before-hand; and alſo that a Year's time be allowed for putting the Work in Order, and even then (though a very conſiderable profit will be made) yet it is not pretended, under ſome Years more, to bring the Works to the higheſt Valuation. And this being premiſed, I obſerve, Firſt,

That

That in the Year 1693, before the Copper-mines were discovered, Sir *Carbery Price* having recovered his Right from the Patentees of Royal Mines, divided his Interest therein into 4008 Shares, whereof each Share was valued and sold at 17 *l. per* Share; and for the other Moiety he was afterwards offered 40000 *l.* by an eminent Merchant in this City, to be immediately paid down; which he refused for this Reason, that I had then demonstrated to the said Sir *Carbery*, and his Partners, that with a sufficient Stock he would be able, in a few Years, with six hundred Men, to bring in a clear Profit from one of the said Veins, of 70500 *l. per Annum*; as by a Paper printed in the Year 1693, may appear, and herein set forth as followeth, *viz.*

Six

Six hundred Men employed at the great Work, when the Levels are up, at 8 *s.* 6 *d. per* Tun, for Getting, Washing and Making Merchantable, as it is now got, every two Men must get above a Tun by Week to make them Wages; but at the rate of one Tun a Week, the six hundred Men will raise three hundred Tuns by Week, and at fifty Weeks fifteen thousand Tuns by the Year; this Charge of Getting is	*l.*	06375
Carriage to the River *Dovey* at 5 *s. per* Tun		03750
12 *d. per* Tun by Water, and for Landing it into the Storehouses at the Port of *Aberdovey*		00750
Fifteen thousand Tuns of Oar will make ten thousand Tuns of Lead, smelting of this when our Mills are up, at 15 *s. per* Tun		07500
Charges		18375

Ten

Ten thouſand Tuns of Lead, at 9 *l. per* Tun	90000
Charge of getting, waſhing, and ſmelting	18375
Sinking Shafts, and incident Charges	1125
Clear Profits	70500

Some Gentlemen have condemned me very much for giving in ſuch an Account, as believing this was a greater Product than can be raiſed from any Mine in the World; but under Favour, this will appear a great Miſtake on their ſide, not only from a plain Demonſtration of the thing, as aforeſaid, but from common Experience in other Mines, both at home and abroad.

As, Firſt in *America*, The famous Mine of *Potozi* is a ſufficient Inſtance to the contrary, and therefore I have here inſerted a Map thereof.

Vid. *The original Map in Copper, by* P. Lee, *at the* Atlas, *in* Cheapſide.

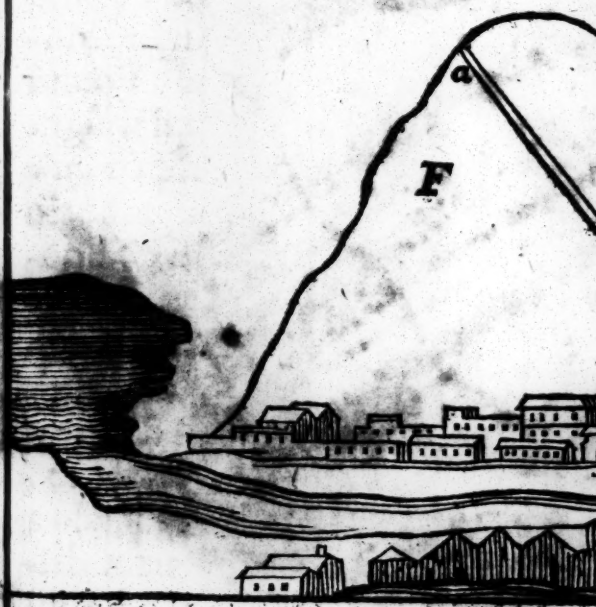
☞ *Place the Map of* Potozi *in the Page following.*

A Deſcription of the Mine of Potozi.

THis Mine lies in the Country of *Chorcas*, in a Province of *Peru*, Seventy Leagues from the Sea, within the Tropicks, in Twenty one Degrees of South Latitude, and was diſcovered in 1546. From this great Vein, which is about Six Foot wide, doth iſſue out ſome ſmall Sprigs of little account; and yet here they refine Thirty Eight Millions Five Hundred Thouſand Pound weight of Silver yearly, one Pound weight of their Oar yielding one Ounce of fine Silver, at which rate, they muſt raiſe in Oar yearly Two Hundred Fifty ſix Thouſand Two Hundred Fifty Tuns, before they can anſwer that Account in Silver; but, by *Gerard Molino*'s Account, they muſt raiſe a great deal more. The great Vein runs directly North and South, ſloping in the Hill: They have made a Level which they were 22 Years a driving, but, being very crooked and running far under Ground, they carry up their Oar on their Backs, each Man about

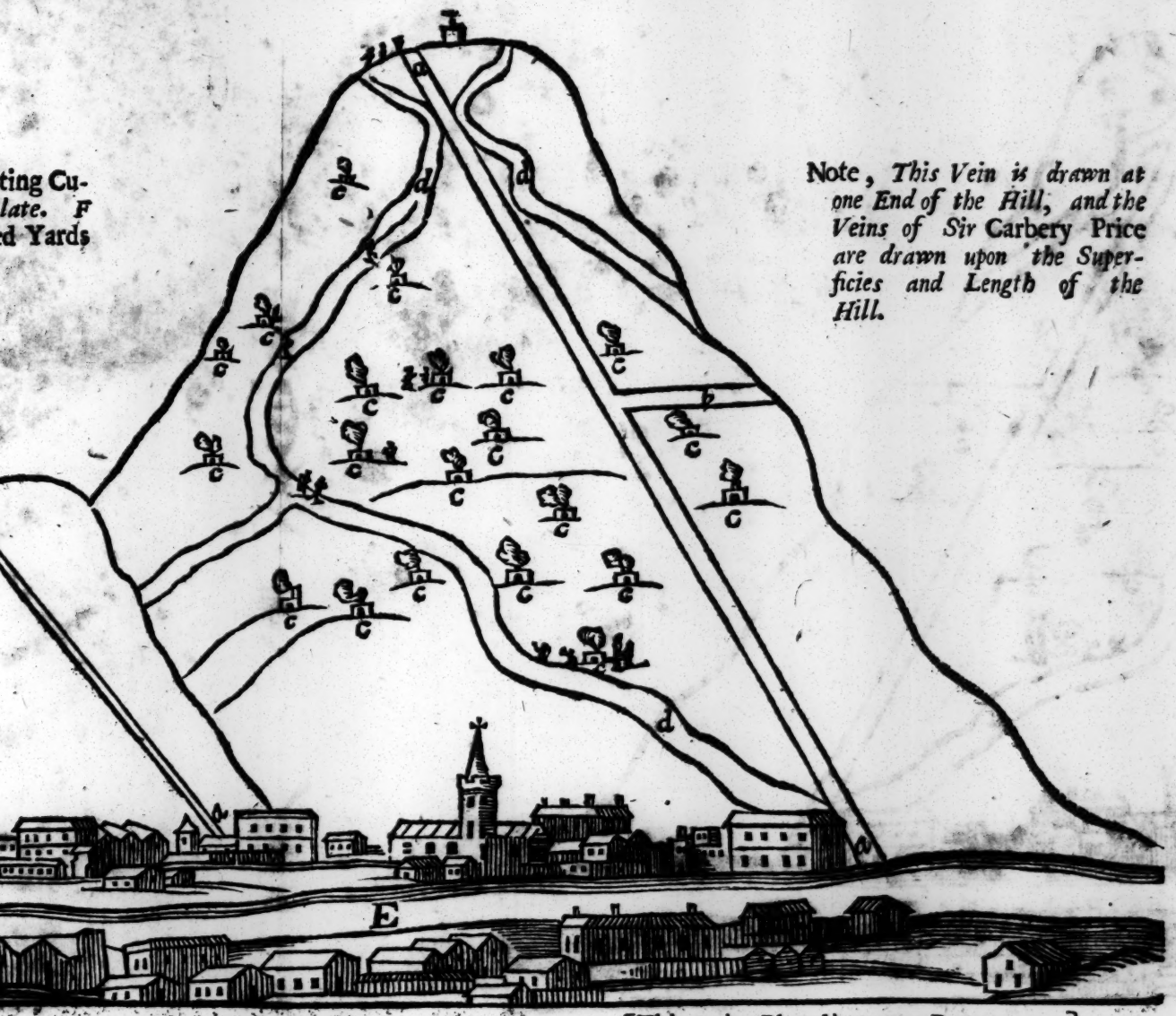
The Sil

The Vein. *b* The Level. *c* The Smelting Cu
ilo's. *d* The Road. *E* The River of *Plate*.
oung *Potozi*. The Scale is four hundred Yard
n an Inch.



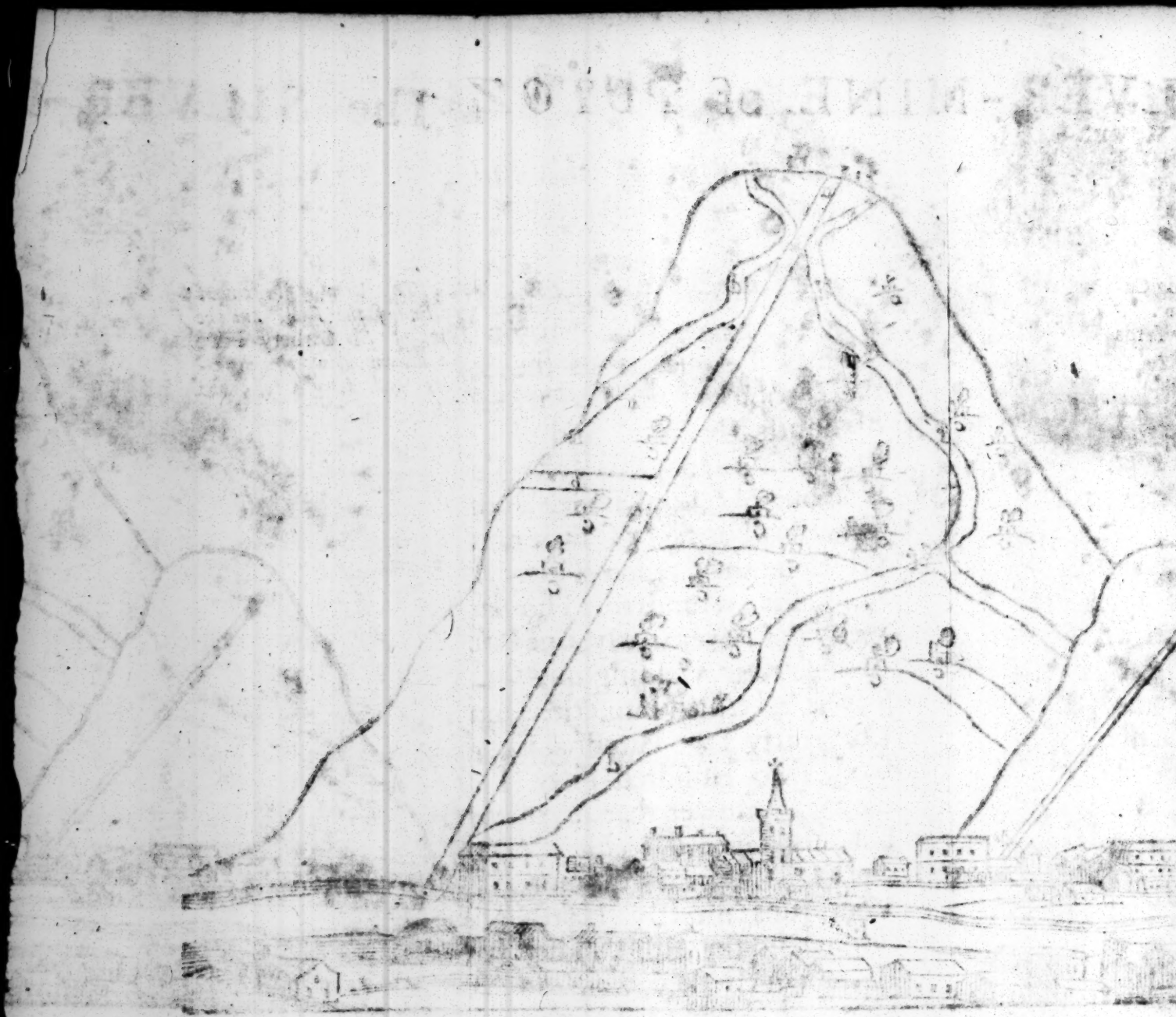
LVER-MINE of *POTOZI.*

ting Cu-
late. F
d Yards



Note, *This Vein is drawn at one End of the Hill, and the Veins of Sir* Carbery Price *are drawn upon the Superficies and Length of the Hill.*

[This to be Placed between Page 10, 11.]



bout 50 *l.* weight in Wallets, on Ladders made of Neats Hides, three and three in a Row, one of the three having a Candle tied to his right Thumb, to give the reſt light.

This Work employs above Twenty Thouſand Miners, and is wrought Night and Day, above a Thouſand Yards deep: See *Acoſta* in his Natural Hiſtory of the *Indies*, and the Hiſtory of the New World, by *N. N.*

And ſeveral Merchants, that have Travelled into thoſe Parts, relate, That this Mountain, by reaſon of the numerous Smelting-houſes built upon it, doth look at a diſtance as if it were all on Fire: And, That theſe Mines have been the occaſion of building of a very fine Town, at the bottom of the Hill, called, The Town of *Potozi*.

Thus you ſee what great things are done at *Potozi* by the poor *Indians*; they can raiſe Two Hundred Fifty-ſix Thouſand Two Hundred Fifty Tuns of Silver Oar in a Year; and, yet in *England*, 'tis thought a Fiction and a Romance, and, by ſome, a meer Cheat to draw in Perſons, to ſpeak of raiſing but Fifteen Thouſand Tun of Oar in a Year. I could hear-

tily wiſh, for my Country's ſake, that theſe Mines were as rich in Silver as that, I ſhould never doubt, but in a reaſonable time, to equal them in raiſing Oar, from Veins exceeding them in Breadth and wideneſs, and in many other Reſpects, provided there were a Stock proportionable employed in the working of them; for there that Mine is wrought a thouſand Yards deep, here from the Surface of the Ground; there they carry up the Oar on their Backs, in Wallets, as aforeſaid, here with the help of a Windleſs, by which two Men can wind up more than twenty Men can carry on their Backs.

And therefore I hope, in every reſpect, it will be thought no Vanity to affirm, That we have as much Art and Ingenuity in *England* as any of the Workmen in *America*; and I doubt not, but in ſome Years, theſe Mines in *Cardiganſhire*, will give occaſion for erecting as large a Town as that at *Potozi*, which may deſervedly be called by the Name of *Welſh Potozi*; and, one Advantage at leaſt, theſe will have above *Potozi*, that whereas that Mountain is Seventy Leagues from the Sea, here the Proprietors, and Minors, for their Encouragement,

ment, may have the delightful Proſpect of ſeeing the Ships ſailing into the Port of *Aberdovey*, to bring them ready Money for their Commodities.

But, to come back into our own Country, there are ſeveral Works in the North that come up to this printed Propoſal, conſidering the difference between the Veins; for the *Right Honourable the Earl of* Darwenwater hath, or lately had, Mines of Lead, in *Auſton-moor*, in *Cumberland*, about Thirty Miles from the Sea, and made of his Duty (which is a fifth part of the Work) 12000 *l.* a Year. Another eminent Lord, in the North, from a ſmall Vein of Lead, three Foot thick, doth, or lately did, clear 17000 *l.* a Year. Another noble Lord, from a ſmall Vein, not two Foot thick, and thirty Miles from the Sea, doth, or lately did, clear above 7000 *l.* a Year, betwixt him and his Farmers, and ſeveral more ſuch Veins there are in the North.

Now if theſe ſmall Veins, whereof ſome of them are Thirty Fathom deep before they come to the Oar, and ſo far from the Sea, can make ſo great a Profit clear above all Charges, What muſt thoſe Mines yield, whereof one Vein is ſo large

as

as aforesaid, and the least as big as any of them in the North, especially when the Levels are made in a cheap Country, and so near the Sea: But the Advantage of these Works may farther appear, by an Essay on the Value of the Works in the North, and these compared together, as followeth.

A small ESSAY, *by a Medium of Prizes, as Oar is got in the North, and in* Wales *at* Eskirhir, *compared together.*

THe raising Fifteen thousand Bing of Oar, at 15 *s. per* Bing, which is the middle Price between 10 *s.* and 20 *s. per* Bing, amounts to

l. 11250

Note, *That two Bing and one half is one Tun of Oar; but 4 Bing is allowed to make a Tun of Lead.*

The Duty allowed to the Lord is $\frac{1}{7}$ Share and a half, being a Medium betwixt a 10 and a 5 Share, But I'll admit a 7, and that amounts to 2142 Bings, and $\frac{5}{7}$ but I'll admit of one Bing more, which makes 2143 Bings, which being deducted out of 15000 Bings, there remains 12857 Bings, which, at 4 Bings to a Tun, will yield 3214 Tuns and $\frac{1}{4}$ of smelted Lead. The Charges of smelting thereof at 15 *s. per* Tun, amounts to

l. *s.*
2410 10

The

	l.	s.
The incident Charges is accounted one third of raising the Oar, being their Shafts are so very deep, and at that rate amounts to	3750	
The middle Price for Carriage to the Water-side, between 20 *s.* and 34 *s.* is 27 *s. per* Tun, which, for the said 3214 Tun of Lead, will amount to	4338	18
Charges	21749	08
Let the Price for Lead, in both Essays, be supposed to be 10 *l.* which for 3214 Tuns, will amount to	32140	
Out of which the whole Charge aforesaid being deducted, there remains clear Profits	10390	12

Now

Now view this Account turned to *Essirhir* Account, and charged accordingly at a middle Price, as Oar is now raised before the Levels are made.

	l.	s.
The raising Fifteen thousand Bings of Oar, at 5 *s.* 8 *d.* Half-penny *per* Bing, which is 14 *s.* 3 *d.* *per* Tun, which is the middle Price betwixt 8 *s.* 6 *d.* and 20 *s.* *per* Tun, doth amount to.	4281	5
This Oar will yield Three thousand seven hundred fifty Tuns, being Five hundred thirty six Tuns more than in the former Essay, by reason here is no Duty paid out to the Lord. The charge thereof for smelting, at 15 *s.* *per* Tun.	2812	10
Sinking Shafts, *&c.* being it lies so near the Surface, is one fourth of raising the Oar.	1070	6 3
The Carriage of Three thousand seven hundred fifty Tuns by Land, 5 *s.* and by Water 1 *s.* in all 6 *s.* to the Port *Aberdovey*.	1125	0

Three thouſand ſeven hundred fifty Tun of Lead, at the ſuppoſed Price of 10 *l.* *per* Tun, amounts to	*l.*	37500
Clear Profits	29335	18 9

NOTE, That in the firſt Eſſay of Works in the North, it appears by Computation, that Seven hundred and fifty Men muſt be employed for the raiſing of the ſaid Fifteen thouſand Bings of Oar, allowing 6 *s.* *per* Week Wages for every Workman; now, if the ſame number of Men, and at the ſame Wages, be employed at *Eskirhir*, they will raiſe Thirty nine thouſand four hundred and ſixteen Bings, by reaſon the great Vein is ſo much larger, and the Oar is raiſed at ſo ſmall a Price as 5 *s.* 8 *d.* ½ *per* Bing, which proportionably to the firſt Eſſay, being four Bings to a Tun, makes Nine thouſand eight hundred fifty four Tuns of Lead; but this laſt Eſſay cannot be fully perfected, without ſhowing more at large what Difference it makes, by employing Seven hundred and fifty at *Eskirhir*.

Seven

Seven hundred and fifty Men muſt raiſe thirty nine thouſand four hundred and ſixteen Bings, to make their uſual Wages to every Man, of 6 *s.* *per* Week, at 5 *s.* 8 *d.* ½ *per* Bing. This Charge amounts as before to	11250	
This Oar will yield Nine thouſand eight hundred fifty four Tuns of Lead, which, at 15 *s.* *per* Tun Smelting, is	7390	10
Carriage by Land 5 *s.* and by Water 1 *s.*	2956	4
Sinking Shafts and incident Charges,	1070	6 3
Charges	22667	0 3
Nine thouſand eight hundred fifty four Tun of Smelted Lead, at 10 *l.* *per* Tun, is	98540	0 0
Clear Profits	75872	19 9

So that hereby it plainly appears, That the ſame number of Workmen that bring in a Profit of 10390 *l.* 10 *s.* in the Works of the North, being employed in the great Vein above-deſcribed, would bring in a clear Profit of 75872 *l.* 19 *s.* 9 *d. per Annum.*

It is farther objected by ſome, That ſo great a number of Men cannot be employed in any one Work, and though all the other parts of the Calculation muſt be allowed to be true, yet it will fail in that Particular.

Anſw. That in *Arkendale*-Works, in *Yorkſhire*, which is a ſmall Vein, about two Foot wide, there was Six hundred Men employed at three Shifts, Two hundred Men at a Shift, every eight Hours, and only one Man in a Breaſt, whereas this great Vein employs ſix Men in a Breaſt, on every Stage or Stelch, and more Stages can be raiſed there than could be done in *Arkendale*-Works: And in the Work of my Lord *Darwenwater* was employed above a Thouſand Men. In *Cornwal*, and ſome of the Tin Works, employs above Fifteen hundred Men, and in *Germany* they employ a greater num-

At Keſwick, in Cumberland, was employ'd 4000 Men in one Mine.

number, and ſo in *Sweedland*, *Hungary*, *Poland*, &c. but in the *Weſt-Indies* Ten thouſand, and in ſome Mines above Twenty thouſand Men are employed in a Work, as at *Potozi* aforeſaid, and even in theſe very Works, in *Eskir-hir* in ten Yards ſpace, at three Shifts, every eight Hours, was employed eighteen Men at a Shift, Fifty four Men in every Twenty four Hours; and, with a reaſonable Stock, twenty ſuch Diſtances may be made, which will employ, at the ſame rate, above a Thouſand Men.

Windſchalht *Mine in* Hungary, *employs* 2000 *Men. Vid.* Browns *Travels*, p. 90.

But this is a new Diſcovery, and, conſequently cannot ſucceed in the firſt Adventurers Hands: The truth is, That the Profit appears ſo very conſiderable, that tho' there is nothing of any moment to be objected againſt it, yet the greatneſs of the thing makes it ſeem improbable; For, ſay they, ſuch a thing was never heard of in *England*, therefore it is impoſſible it ſhould ever happen: This is the force of the Objection, but, as there is a Reaſon offered, ſo let Reaſon be oppoſed, and then the Matter will come to a fair Determination; for the very ſame Objection was made againſt the Project

of

of the New-river Water, where a Share was ſaid to be valued at firſt at no more than 100 l. ſoon after at 500 l. and afterwards Thirty ſix Shares were ſold for One hundred and fifty one thouſand Pounds, to *Simon Middleton*, a Merchant, and the whole Intereſt of the New-river Water is valued at this Day at 300000 l. at the leaſt.

The General and Penny-poſt Office were at firſt eſteemed as meer Projects, and ſlighted in the beginning, and yet came afterwards to be of great Value, and theſe things though demonſtrated at firſt, yet were not believed, and no Reaſon could be oppoſed, but only the greatneſs of the Propoſal made them ſeem improbable.

And though every new Trade and Voyage, the Merchant contrives, is at firſt a Project, and ſo by conſequence the Trade to the *Eaſt-Indies*, *Turky*, *Africa*, and *Hudſon's* Bay, *&c.* were meer Projects in the Original, and tho' the firſt beginning of theſe Mines might be ſaid to be a Project, in ſome Reſpect, by reaſon of the uncertainty, before they had found the Veins; yet I cannot now allow, that there is any thing in this Undertaking

dertaking, that ſo much as looks like a Project, ſince every thing is reduced to a certainty before-hand, the Veins being long ſince diſcovered, fixed and ſettled betwixt their firm and ſolid Sides, many hundred Tuns of Oar got out of them, till the Water grew troubleſome, and the Partners could not agree to raiſe a ſufficient Stock, for bringing up a Level to drain the Water from them; but if a Man has a thouſand Acres of the richeſt Meadow-ground, and has no ſtock of Cattle himſelf, nor will buy a ſtock, or rent the ſame out to others that have one, all that rich Land muſt lie dead and unprofitable, and yet without any Diſparagement to the goodneſs of the Land; ſo if a Man has the richeſt Mines in the World, even *Potozi* it ſelf, and yet is not willing himſelf to raiſe a competent Stock to make Levels, *&c.* and carry on the Works, nor will part with them to others that are; he can expect no Profit from them, though ever ſo rich and profitable in their own Nature; and this Accident does not leſſen the intrinſick Value of the Mines to Men that have both Stock and Skill to manage them.

And

And to ſuch it is not doubted, but theſe Mines, in a few years will be worth above a Million of Money: For, to return, if this great Vein will yield ſo much alone, What will all the other Veins yield, which are five in number? Beſides the two Copper Veins, and, taking one with another, more large than any in the North; but if my Lord *Darwenwater* receiv'd 12000*l.* a year for a fifth part of a Work, I hope I may modeſtly compute every one of the five Veins at 12000*l. per Annum* each, for the whole Intereſt thereof, (there being no Duty to be paid to the Lord of the Mannor) which in the whole, is 60000*l. per Annum* more. And ſo much for the Lead-Mines only.

As to the Copper Mines.

IT appears by the Map, that one is four Foot wide, and the other five Foot wide, betwixt their firm Sides, which are very great Veins of that kind, and the like ſcarce known in theſe Parts; and though they are not carried on to any deepneſs, the one being found at three Yards, and the other at fifteen Yards deep, and are yet mixt with Vein-ſtone, and ſo not come to the beſt Oar, which by the Courſe of ſuch Veins grow much more Rich as they take more ground upon them, yet at preſent, the one yields three Tuns of Copper out of twenty Tuns of Oar, which is better than one ſeventh; the other five Tuns from twenty, which is one out of four, as by frequent Trials has been experienced; and this ſort of Oar ſmelts into malleable Copper, in one Furnace, at the firſt Running, inſomuch that the Profit of theſe two Veins will be very great, whether ſold by the Tun, or ſmelted into Copper, which may be computed thus:

A Computation of the Value of t
Copper Mines.

THeſe two Veins, will, in a ſhort time, employ at three ſeveral Shifts, every eight hours, ſeveral Hundred Men; but I will ſuppoſe but one hundred Men in each Vein, and the Price of getting the Oar at 20 *s.* *per* Tun, though it may be got for leſs; when the Levels are made, theſe two hundred Men to get their uſual Wages, muſt raiſe ſixty Tun *per* Week, which, at fifty Weeks in the Year, is three thouſand Tun a Year, and ſo the Charge of raiſing the Oar is

l.
3000

Note, *In* Keſwick, *in* Cumberland, *was employed* 4000 *Men in one Copper Mine.* Sir John Pettus, *Fodinæ Regales*, p. 32.

This

This Three thouſand Tun of Oar, at one Fifth and a half, being a Medium between a Seventh and a Fourth, (but to give a good Allowance, taking one Sixth for the Common Product) will yield Five hundred Tuns of Copper, which, at 20 *l.* *per* Tun, for Smelting and Refining, the Charges thereof will amount to	*l.*	10000
Carriage of Five hundred Tuns of Copper, to the Port, at 6 *s.* *per* Tun		150
Sinking Shafts, and other incident Charges		750
The whole Charges		13900
Five hundred Tun of Copper, at 100 *l.* *per* Tun, amounts to		50000
Clear Profits		36100

Object. That the most famous Copper-work in *England* does not make above two or three Hundred Tuns of Copper in one Year.

Answ. That in most other Works great part of the Oars there smelted, are sulphury Oars, and must be run through six or seven Furnaces before they can be refined into good Copper; but if the Managers of those Works had plenty of such Oar as this, which runs into malleable Copper in one Furnace, they would make five hundred Tun of Copper more easily than they make Two hundred Tun now.

Object. That the Charges and Smelting and Refining is too little in this Calculation.

Answ. That for smelting and Refining sulphury Oars this may be too little, but for this too much, this Oar not requiring above one fifth part of the Firing and Workmanship incident to the other, for the Reasons aforesaid.

Object. That so vast a Product from Copper-mines seems altogether improbable; that such a thing was never heard of, and that it is a great matter to make 100000 *l. per Annum* of one Copper-work.

Answ.

Anſw. This is an Objection, but no Reaſon offered but want of a Precedent, which may be found in *Sweedland*, and *Hungary* and in many places, and when it is conſidered, that there is ſuch Oar to be had in *Wales*, that yields ſo rich a proportion of Metal, and nothing can be ſaid why ſo much Oar may not be raiſed every Year, when the Levels are made, which will yield ſo many Tun of Copper at ſuch a Price, and when the vaſt difference between theſe ſorts of Oar, and the ſulphury Oars is alſo conſidered, and how the Price of the later is raiſed conſiderably of late, ſo that with the Charges for the ſulphury Oar, for great Land-carriage, for great Quantities of Coal, for ſo many Smelters Wages to attend ſuch a vaſt number of Furnaces as is uſed for ſuch Oars, with the Reparations of the Furnaces, *&c.* It is well if 20 *l. per* Tun be got clear from that Oar; and, from this, 72 *l. per* Tun will be got clear by the Owner thereof, by reaſon the Charges is ſo ſmall, in all reſpects, as aforeſaid: And ſo upon the whole Matter, the ſame Perſon may better make 36100 *l. per Ann.* clear of theſe Oars, preſuppoſing them to be his own, as aforeſaid, then 10000 *l. per Ann.* clear

of

of the ſulphury Oars, and buy both Oar and Coal, *&c.*

Thus much in general.

But here is one thing more particularly to be obſerved, That whereas ſix or ſeven thouſand Pounds are laid out, in bringing up a Level to a ſingle Mine, perhaps not ſo large as the leaſt of theſe; here one Level, that will not coſt near that Sum, by a croſs Drift, will ſerve for moſt of thoſe Veins, and thereby ſave a vaſt Sum of Money.

Object. That if theſe Mines were ſo rich as is pretended, it is not probable the preſent Partners, concerned therein, would let them lie dead and unwrought.

Anſw. The preſent Partners want a Stock, and cannot agree in Ways and Means of raiſing of it; ſome are willing, but not able, others are able, but not willing, though they have frequent general Meetings for that purpoſe; ſome want Money, and yet are loath to part with their Shares under what they coſt them; others have Money, and will not lay it down for thoſe that have none, unleſs they can have a great Bargain;

ſome

ſome again complain, that they are not right in their Conſtitutions, and will lay down no Money till theſe are rectified, and, whoever peruſes the preſent Propoſals, from the Committee, to Mr. *Price*, will ſee where the Fault lies, and, that neither ſide labors, at this time, under the leaſt Apprehenſions, that the Mines will not anſwer their utmoſt Expectations, if they had a ſufficient Stock to make the Levels, and carry them on.

Object. Now, upon the whole Matter, the only Objection that ſeems to be left is this, That Mines, under Ground, are uncertain things, and, if they ſhould happen to fail, then all the Money laid out upon them will be loſt, and, tho' they ſhould yield good Oar, yet they may not laſt out half the Term.

Anſw. The Terror of a Royal Mine has long kept a great part of this Nation in Ignorance, or elſe this Objection would never be made; for in *Sweedland*, *Denmark*, *Germany*, *Poland*, and *Hungary*, and even amongſt the barbarous *Indians*, where the Mining Trade is encouraged, it is well known, That Nature is regular in its Productions under Ground as well as above, inaſmuch, as the Knowledge

ledge of these things is become a Science, and many learned Volumes, in several Languages, by *Agricola*, and others, have been written on that Subject.

The Inhabitants of *Cornwall*, *Darbyshire*, *York-shire*, *Cumberland*, *South-wales*, and about *New-castle*, can tell how certain and regular Nature is in this Case: for, although sometimes they meet with Difficulties in the first finding of a Vein, as when they meet with a small Sprig of a Vein, which often appears and vanishes again before they come to the main Body, yet when once they have found the main Vein, between its firm Sides, they never lose such a Vein, without an apparent Reason above Ground, (as by some very deep Dingle or Valley) especially in Lead or Copper Mines, where the Veins lie perpendicular, or sloping downward; but for Horizontal Veins, as in Coal, sometimes, a perpendicular Rock will cut its Vein in two, and thereupon the Vein may rise or fall on the other side, which is commonly called a Rise or Dip-dike; but ingenious Artists seldom fail to recover it again: But *Note*, in these Mines, they have been so fully tried from one end of the Hill to the

the other, in ſeveral Places, that there is no room for that part of the Objection in this place.

And as to the other part thereof, it was never known, that the bottom of any fixed Veins of Lead or Copper, eſpecially ſuch large ſetled Veins, with firm Sides, was ever found, or the Works left off, till that the ſame were carried on as deep as the Water would permit; and any Perſon that is acquainted with Mines can inform us, That it is not poſſible to work out theſe Veins with ſo deep a Level within the Term of twenty one Years, eſpecially ſince the Veins ſtill grow richer and wider as they grow deeper; but if it be conſidered, that the Mine of *Potozi* (not above Six Foot wide in any place) has laſted from the Year 1546, with Twenty or Thirty Thouſand Men at work, that Objection muſt for ever ceaſe.

Vide Brown's *Travels to the Mines in* Hungary. *p.* 98.

And now, upon the whole Matter, It is a wonderful thing to conſider our *Engliſh* Merchants (Perſons of great Worth, Judgment and Experience) what vaſt Sums of Money they will venture, view

the fartheſt Countries in the World, ſpread their Sails to the uttermoſt part of the Earth for Traffick; how many Millions they have laid out in the *Eaſt-India* Trade, in building Forts, Caſtles, and Garriſons, maintaining Factories and Conſuls, building vaſt Ships, and expoſing all to the greateſt Hazard of Pirates, Tempeſts and Storms, and yet are eaſily diverted from venturing a ſmall Sum at home in their own Nation, to improve a Trade from the growth of our own Country, though it would yield double the Profit, and far leſs of Hazard.

All the reſt of the World are ſtriving to engroſs Trade, and yet this at home remains neglected. This Trade of Lead and Copper, will, in ſome Years, be better known in *England*, and, its probable, it will hereafter be a Wonder to the Nation, that ſo vaſt a Treaſure ſhould be ſo long forgotten, and, without doubt, whoever happens to be ſo fortunate as to look into theſe things in time, before they grow too common, will have opportunity of great Bargains, and of raiſing vaſt Eſtates to their Families, and of bringing a Bleſſing on their Undertaking, by introducing and encouraging ſuch a Trade,

as

as will employ many Thouſands of poor People, and ſhift them from their Dens of Lazineſs, and, by hard Labour, fit them for the Service of their King and Country, either in time of War or Peace.

This Trade would conduce not only to the Advantage of particular Merchants, Tradeſmen, and Labourers, and to the particular Countries, where the Mines lie, but of the whole Kingdom in a National Profit, by promoting a Foreign Trade to *Holland*, *France*, *Spain*, *Portugal*, *Italy*, *Turkey*, the *Indies*, &c. with the Commodities of our own Country, without exporting our Coin or Bullion out of the Nation: This would make, Perſons concerned therein, Merchants as well as Miners: *And, in ſhort, would make* England, *not only the moſt delightful, but one of the ſtrongeſt and wealthieſt Kingdoms in the whole Chriſtian World.*

A N

APPENDIX,

Concerning the

SILVER

That may be

Extracted out of theſe MINES.

I Preſume, many Perſons, eſpecially thoſe that were concerned under the Society of Royal Mines, may much admire that I have not, in my Eſſay, ſaid one Word of the Silver that may be extracted out of theſe Mines, eſpecially, ſince ſo many Trials have been had, in *Weſtminſter-hall* about that very Point, and ſuch Proofs made of the Richneſs of them in Silver, by great Numbers of Witneſſes upon Oath.

I muſt confeſs, ſome part of theſe Veins do yield Silver, for the great Vein lies in Ridges or Rows, like the Planks in a Floor, *viz.* One Ridge of Potters Oar, (which is the richeſt of Lead Oar) and another of Silver Oar, which is poor in Lead, and rich in Silver; and I do not deny, but to the Owner, that has the Oar for nothing, tho' it is not rich enough to take it from him, ſince the late Act concerning Royal Mines, yet it is ſo rich, as that a conſiderable Profit may be made out of the ſame.

But, I do not think fit, at preſent, to enlarge on this Subject, nor on the Method of doing thereof, nor diſcloſe the Art of extracting Silver out of Lead, to the beſt Advantage, but ſhall be ready hereafter to communicate my Thoughts thereof, as Occaſion ſhall require.

However, I preſume, I may, without Prejudice, take notice, That Sir *John Pettus*, in his Treatiſe, call'd, *Fodinæ Regalis*, p. 10. demonſtrates the Value of Goginian, Coomervin and Darrein Oar, that they yield in Silver *per* Tun, of Metal, Fourteen Pounds, beſides the Lead; but if the ſaid Tun of Metal be made of the Oar of Coomſumbloch, it yields 20 *l.* *per* Tun in Sil-

Silver; and in pag. 33. he tells us, *Tha*
Sir Hugh Middleton *undertook the Silve*
Mines in Cardiganshire, *paying* 400 *l.* pe
Ann. *Rent to the Society of Royal Mines*
and he cleared Monthly the Sum of 2000
and, had he not diverted his Gains to t
making of the New-river from Ware
London, *certainly he would have been Ma*
ster of a Mass of Wealth; but great Wi
and Purses seldom know how to give Bound
to their Designments, and, by undertakin
too many things, fail in all: And we m
farther give Credit to the Beneficialness
those Mines, when as Mr. Tho. Bushel, *b*
his Knowledge and Ingenuity, to work ther
to the best Advantage, did find business e
nough there for a Mint, and, with the Pro
duct thereof, made Provision for the Cloath
ing of the late King's whole Army.

All Persons that know these Mines will agree, That we can raise more Sil ver Oar, from the Mines of Sir *Carbery Price*, than ever was raised from all th other Mines in *Cardigan-shire*, and wit far less Charges and Expences; but if Sir *Hugh Middleton* alone, with a small Stock, could make 24000 *l. per Ann.* and Mr. *Bushel* cloath a whole Army, What might not the present Partners do, if they were

were united, and would heartily joyn together, and raise a Stock answerable to so noble an Undertaking, especially since the Art of Extracting and Refining is much improved of late Years, and may be now done with far less Expence and waste of Lead? I believe we shall not be opposed by any, in case we should affirm, That these Mines, taking one part with another, are as rich in Silver as some of those above-mentioned; and though at this Rate, these Mines would turn to no Account to the Patentees of Royal Mines, since the Price of the Oar will amount to more Money than the clear Profits could be made thereof; yet, to the Proprietors of the Mines, and who have bought the same free from any Duty to the Lord, this Advantage in Silver will make a vast Addition to the former Calculations of the Profit of the Lead only.

But I shall forbear to set it down in Figures, lest I should either raise too great an Expectation on the one side, or frighten the World too much on the other, with the length of Numbers; for nothing displeases some Persons more than a Calculation that sounds so large as this would do, upon a modest Computation,

though

though I cannot see any other Method so secure in order to fix a right Judgment thereof.

For, though some incident Charge may possibly happen hereafter, by ill Management that cannot be thought of at present; yet, by this way, you may demonstrate the true Value so near the Matter, that if reasonable Allowances be made for such Contingencies, a Man cannot easily be mistaken; but, for this I shall not only refer you to what is done in the present Age, at *Potozi*, above mentioned, (and I might Instance in many other Places) but I will endeavour to open the Eyes of those that are Strangers to these things, by letting them all see the Sense of Antiquity on this Matter, and that this is no new Method.

For, *Xenophon*, an ancient *Greek* Author of undoubted Credit, (lately Translated by *W. M.*) and Dedicated to the ingenious Author of the Essay on Ways and Means, speaking of the Improvement of the Revenue of *Athens*, and more particularly on their Silver Mines, goes on thus, (*viz.*) *Our Silver Mines alone, if rightly managed, besides all the other Branches of our Revenue, would be an in-*

inestimable Treasure to the Publick: But, for the Benefit of those who are unskill'd in Inquiries of this nature, I design to premise some general Considerations upon the true State and Value of our Silver Mines, that the Publick, upon a right Information, may proceed to the taking such Measures and Counsels as may improve them to the best Advantage.

No one ever pretended from Tradition, or the earliest Accounts of Time, to determine when these Mines first began to be wrought, which is a Proof of their Antiquity; and yet, as ancient as they are, the Heaps of Rubbish, which have been dug out of them, and lie above Ground, bear no Proportion with the vast Quantities which still remain below, nor does there appear any sensible Decay, or Diminution in our Mines; but, as we dig on, we still discover fresh Veins of Silver Oar in all parts, and when we had most Labourers at work in the Mines, we found that we had still business for more Hands than were imployed.

Nor do I find that the Adventurers in the Mines, retrench the number of their Work-men, but purchase as many new Slaves as they can get; for their Gains are greater or less in proportion to the Number of

Hands they imploy. And this is the only Profession I know of where the Undertakers are never envied, be their Stock or Profits never so extraordinary, because their Gains never interfere with those of their Fellow-traders.

Every Husbandman knows how many Yoak of Oxen and Servants are necessary to Cultivate his Farm, and if he employs more than he has occasion for, reckons himself so much a Loser; but no Dealer in the Silver Mines ever thought he had Hands enough to set to work.

For there is this Difference between this and all other Professions, That, whereas, in other Callings, for Instance, Braziers and Black-smiths, when their Trades are over-stock'd, are undone, because the Price of their Commodities are lower'd of course, by the multitude of Sellers: And, likewise, a good Year of Corn, and a plentiful Vintage, for the same Reasons, does hurt to the Farmers, and forces them to quit their Employments, and set up Publick-houses, or turn Merchants and Bankers.

But here the Case is quite otherwise, for the more Oar is found, and the more Silver is wrought and made, the more Adventurers come in, and the more hands are imployed in our Mines.

A Master of a Family, indeed, when he is well provided with Furniture and Houshold-goods, buys no more; but no Man was ever so over-stock'd with Silver, as not to desire a farther Increase: If there are any who have more than their Occasions require, they hord up the rest with as much pleasure, as if they actually made use of it.

And when a Nation is in a flourishing Condition, no one is at a loss, how to employ his Money; the Men lay it out in fine Armour, and in magnificent Houses and Buildings; Women lay it out in great Equipage, costly Habits, and rich Cloaths.

And, in Accidents of War, when our Lands lie fallow and uncultivated, or in a publick Dearth and Scarcity, What Reserve have we left to apply to, but Silver to purchase necessaries for our Subsistance, or hire Auxiliaries for our Defence?

I have insisted the longer upon these general Reflections, to encourage Adventurers of all kinds, to employ as many Hands as possible in so advantageous a Trade, from these plain Considerations, That the Mines can never be exhausted, nor can Silver ever lose its value.

But to draw this Discourse more immediately to the Subject of my present Consideration,

ration, which is the maintenance of our Citizens, I will begin to propose those Ways and Means, by which the Silver Mines may be improved to the highest Benefit and Advantage to the Publick; nor do I set up for the Vanity of being admired for an Author of new Discoveries, for that part of my following Discourse, which relates to the Examples of the present Age, lies obvious to all the World; as for what is past, 'tis a Matter of Fact, and every Man might inform himself, that would be at the Pains of enquiring.

'Tis very strange, that after so many Precedents of private Citizens of Athens, *who have made their Fortunes by the Mines, the Publick should never think of following their Example; for we who have made inquiry into this Matter, have heard, That* Nicias, *the Son of* Niceratus, *had a Thousand Slaves, employed in the Mines whom he let out to* Sosias, *the* Thracian, *upon Condition to receive an* Obolus *a Day, clear of all Charges, for every Head, and that the same Complement of Work-men should be always kept on foot.*

In like manner, Hipponicus *had six hundred Slaves let out at the same Rate, which yielded him a Revenue of a* Mina *a Day;*

and

and Philemonides *Three Hundred, which brought him in half a* Mina *a Day; and many others made the same Advantage, in proportion to the number of Slaves they possessed: But what need we to appeal to Precedents of an elder Date, when at this Day, we have so many Instances of the same nature before our Eyes?*

Twelve hundred Slaves, when bought, will probably, in five or six Years time, produce a Revenue sufficient to purchase as many more as will make the number six thousand. This number, at the rate of an Obolus *a Day, a Head, clear of all Charges, will afford a yearly Revenue of sixty Talents; and if but twenty of these Talents are laid out in the Purchase of more Slaves, the City may employ the over-plus as they think convenient, and when the number of Slaves is increased to ten thousand, it will produce a standing Revenue to the Publick, of* A Hundred Talents a Year.

To demonstrate, that the Mines would take up a greater proportion of Slaves to work 'em, I appeal to the Authority of all those living Witnesses, who remember what numbers of workmen were employed in them, before the taking of Decelea *by the* Lacedemonians; *and our Silver Mines that have*

been

been wrought for ſo many Ages, with ſuch numbers of Hands; and continue ſtill ſo far from being drained or exhauſted that we can diſcover no viſible difference, in their preſent State from the Accounts our Anceſtors have delivered down to us, are undeniable Proofs of my Aſſertion.

And their preſent Condition, is a good Argument, that there never can be more Hands at work in the Mines than there is employment for; for we dig on ſtill without finding any bottom or end of our Mines, or decay of the Silver Oar.

And Companies of private Adventurers may carry on the ſame Trade in a Joint Stock, nor is there any Danger that they and the National Company will interfere one with another, but, as Confederates, are ſtrengthen'd by their mutual Aſſiſtance to each other; ſo the more Adventurers of all kinds are employed in the Mines, ſo much larger will the Gain and Advantage be to all.

And thus you ſee that theſe Calculations of mine are no new things, but very obvious to the meaneſt Capacity, and commonly practiſed in all Ages and Countries; and there can be no reaſon to doubt but that theſe Silver Mines in *Wales* might prove as rich as thoſe in *Athens* or in *Hungary*,

gary, if carried on with a large Stock, and would not be exhauſted in many Ages; and one reaſon I have (amongſt ſeveral others) to be of this Opinion is this, That all great Veins of this nature are in ſome reſpect like a great large ſpreading Oak, and hath a great number of Branches, which, like Boughs of a Tree, ſhoot out from the Body of the Vein, inſomuch that when a conſiderable Sum of Money is gained out of the ſame, and many Years ſpent in the working thereof, ſo that Perſons would naturally be apt to think that the Vein was almoſt work'd out, there is ſtill diſcovered freſh Veins ſhooting forth from the ſides thereof, which are innumerable and ſcarce ever to be exhauſted. This was the Caſe at *Athens*, *Hungary* and other Places, and would be found the ſame in *Wales*, if enquired into. Nature is the ſame in all Places; and though ſome accidental Variations may happen between Mines in one Country and another, yet they do not vary in Subſtance; and 'tis by theſe Branches that the great Body of the Vein is fed and brought to ſo large a Bulk; you may as well ſee a large Oak without Roots and Boughs,

The Mine at Chremnitz in Hungary, has been wrought 950 Years. Brown's *Travels.*

Boughs, as a large Mine without these Branches: Small Veins have many small Twigs, which being too little to work, are passed by without much notice, as Unprofitable and Useless; but you will find that many Branches of this great Vein will be as large as most Veins now known in the North of *England*: In other Countries they would know how to value such Mines as these, where they have Pits or Shafts Three hundred Yards deep, as *Brown*, in his Travels to the Mine-towns in *Hungary*, informs us, *p.* 98. where he says, that at the Mine at *Chremnitz*, he went down by the Pit called by the Name of the Emperour *Rodolphus*'s Shaft, gently descending by the turning about of a large Wheel, to which the Cable is fastned, a Hundred and Eight Fathoms deep into the Earth, and after many Hours being in the Mine, was drawn out again by *Leopold*'s Shaft, streight up, above a Hundred and Fifty Fathoms; a Height surpassing that of the Pyramids by a third part. And yet in these Parts we will scarce be invited to lay out our Money upon a rich Mine, though it appears at the Day upon the very Surface of the Ground:

The Fortunate have Hours, and those they choose;
The Unfortunate have Minutes, and those they lose.

I shall conclude with the Words of Sir *John Pettus*, who saith, fol. 5. as followeth, *viz. Besides the Enjoyment of the Metals and Minerals digged from the Earth, the Benefit to the Nation is great; for, in the* Book of Rates, *we shall find above two hundred particulars of ingrown Metals and Minerals, which do afford great Customs to the Crown, and would do much more, if the Management from their original Vent were daily inspected.* And in Vol. 34. he says, *That it might be added, with submissive Confidence, that with due Care herein, we might give Law to all* Europe, *as to all Utensils of Metals, whether considered Domestick or Publick, Civil or Martial.*

And the Advantages being so, we may justly infer, that by the not duly and carefully managing of this Affair, the Disadvantages are in the same degrees as much prejudicial to the Interest of this Kingdom, as the due Use of them would be profitable. For it is

clearly demonſtrable, that every Year, for many Years paſt, this Kingdom hath, by negligence herein, loſt a Million of Money, which, by Vigilance, they might have ſaved, whereby we want when others abound with our Natural Store.

CON-

CONCLUSION TO All the PARTNERS.

AND thus I began, so I beg leave to conclude this little Tratise under your Patronage and Protection.

I must confess, much more might be said on so fruitful a Subject; but you will consider, that I was brought up a Miner, and not an Orator; my Business is to demonstrate the Truth in as few words as I can, not to put a Varnish upon it, and to Write, not what may be said, but what may be done.

And now, in order to the Accomplishment of what I have Writ, I have but one thing more to offer to your Considerations, and that is of such a Nature, as I

know will be very pleasing and agreeable to you, *viz.* That the Poor may have some small Share with you in so rich a Treasure, especially the poor Miners and Labourers; That when they have spent their Lives to make you Rich, and are grown Impotent, and unable to Work, either through Age or Accident, they may may have a comfortable Subsistence provided for them.

This will bring a Blessing from Heaven on your Undertakings, and encourage the most skilful Miners (and at lower Rates) to resort to that Work, where they shall be provided for in their old Age, and against all Accidents.

And this will tend to no small Advantage of all the Partners concerned, who will every Year save more by cheap Bargains, than the Charity will amount unto; and, in this case, every Miner will have an Interest in the Works, and will be as careful thereof, as if they were his own. Your Works will never be in want of able Miners, or in danger of being lost either by Neglect or Treachery; you may then be truly called, *The Friendly*

Society

Society of Minerva, and fear no Combination to destroy your Works.

'Tis wonderful to observe how punctual and exact Xenophon was to engage a Divine assistance in the like case; whose words are these:

And if the Publick, upon due consideration, think fit to execute these Orders and Institutions, I would advise them to send Ambassadors to Delphi, *and* Dodona; *to consult the Gods, whether such a Reformation of our Government would not turn to the Advantage of the present Age, and the benefit of all Posterity.*

And if these Resolutions are ratify'd by the Divine Approbation, to consult the Oracle once more, to the protection of what Gods we should recommend the Success of this Enterprise, and then to propitiate those Gods we are directed to apply to, in order to engage their Assistance; and, after this solemn Invocation, to enter boldly upon the Execution of this Design; for 'tis but reason that all Undertakings should be attended with more favourable Success, that are begun, and carried on, under the immediate Care and Protection of Divine Providence.

Methinks

Methinks 'tis great Pity that *Xenophon* was not a Christian, and as great a Shame that there should be so many Christians who have not the Devotion of *Xenophon*.

Who can admire that Mines are sometimes unsuccessful, when Men presume to dig out the very Bowels of the Earth, enter into the Secrets of the Deep, and rifle the choicest Cabinet of Nature, without so much as consecrating the least part thereof to Pious and Charitable Uses?

And, on the other side, who can doubt Success in any thing Sir *Humphry Mackworth* undertakes? When his Designs appear so generous to his Partners; so charitable to the Poor, and so much conducing to the Publick Good? And it is my hopes and belief that his Example, and good Success in his Undertaking, will be a means to encourage others to do the like, and to follow such a precedent as may in time extend to make a Provision for all the Poor of *England*.

And therefore that he may not be diverted from so good a Design, but may receive Encouragement from you to continue

tinue ſteadfaſt to his former Reſolutions, and labour now for the Poor, who will hereafter labour for you: And that you may all, not only obtain a Temporal, but an Eternal Treaſure, that can never be exhauſted, is, and always ſhall be, the Prayers of,

Your HONORS

Moſt Obedient, and moſt Humble

Servant to Command,

WILLIAM WALLER.